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SELECTION OF CANDIDATES FOR THE CIVIL ENGINEER CORPS OPTION IN THE NAVAL RESERVE OFFICERS TRAINING CORPS PROGRAM

HARRY C. WILLS

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SELECTION OF CANDIDATES FOR THE CIVIL ENGINEER CORPS OPTION IN THE NAVAL RESERVE OFFICERS TRAINING CORPS PROGRAM

A THESIS

SUBMITTED TO THE

SCHOOL OF EDUCATION AND

THE COMMITTEE ON GRADUATE STUDY

OF

LELAND STANFORD JUNIOR UNIVERSITY

IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS

FOR THE DEGREE

OF

MASTER OF ARTS

By

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Lieutenant Commander, Civil Engineer Corps
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June, 1950

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H. C. W.

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CHAPTER I

INTRODUCTION

The Naval College Training Program

The two major sources of procurement of officers for the Regular Navy and Marine Corps are the Naval Academy at Annapolis, Maryland, and the Naval Reserve Officers Training Corps Units which are established in fifty-two of the leading colleges and universities of the United States. (59) The Naval Reserve Training Corps Units also provide a supply of well-educated junior officers for the U.S. Naval Reserve and the U.S. Marine Corps Reserve.

The Naval Reserve Officers Training Corps was established in 1926 for the purpose of qualifying certain college students for commissions in the Naval Reserve. The mission of the Naval Reserve Training Corps was greatly expanded in 1946 to include the training of career officers for the Regular Navy.

Candidates for Naval Reserve Training Corps scholarships and commissions in the Regular Navy are selected by a competitive process in which the ablest candidates from each State and Territory are selected to fill the quota assigned to that State or Territory. Successful candidates are appointed Midshipmen, U.S. Naval Reserve, and are known as Regular Naval Reserve Officers Training Corps students.

In addition to the Regular students on Navy scholarships, training for Contract students is provided under the Naval College Training Program. The Contract students are selected by the Professor of Naval Science from among the students already enrolled in one of the fifty-two universities included in the program. The Contract students are in training for commissions in the U.S. Naval Reserve or the U.S. Marine Corps Reserve.

Under provisions of Public Law 729 - 79th Congress, approved August 13, 1946, approximately 1800 civilians and 200 enlisted personnel are selected each year for enrollment in the Regular Naval Reserve Officers Training Corps Program. The selection procedures for civilians will be covered by this study. The selection procedures for the enlisted personnel are based on similar requirements and will not be specifically cited. To provide a basis for selection, candidates for appointment as Regular students are subject to the following procedure:

(1) Establish Eligibility

Must be male citizens of the United States between the ages of 17 and 21 years.

(2) Physical Requirements

Must meet physical requirements established for Midshipmen of the Naval Academy.

(3) National Aptitude Test and Personal Interviews

Must score sufficiently high on a competitive national aptitude test and indicate officer-like

qualities during two personal interviews to be further considered.

(4) Final Selection

Based on a review of information collected in steps (1), (2) and (3) above, be selected by a State Committee for appointment as a Midshipman in the Naval Reserve Officers Training Corps Program.

The Regular student program provides not more than four years of Navy-subsidized education. The government pays the cost of tuition, textbooks, as well as furnishing necessary uniforms. Midshipmen also receive $50.00 per month to assist in paying other expenses. Students will normally attend college for four years. They may follow any course leading to a baccalaureate or higher degree subject to restrictions on certain courses that require more than four years to complete. During his college program the student must complete 24 semester hours of Naval Science subjects. The student must also complete mathematics through trigonometry and one year of college physics by the end of his sophomore year. For the student enrolled in a five year engineering course, the Navy grants a one year leave of absence so that the student may obtain his engineering degree. Each regular student must complete three summer cruises of eight weeks prior to graduation.

Upon graduation Regular Naval Reserve Officers Training Corps Students must accept commissions as Ensign, U.S. Navy,

or Second Lieutenant, U.S. Marine Corps, if physically qualified. After two years of active duty, the officer will be given the opportunity to serve an additional year and to apply for retention in the Regular Navy or Marine Corps as a career officer.

Several variations in the program are possible. A Regular student may study for a commission as a line officer in the Navy or in the Marine Corps, or he may follow a course which would lead to a commission in the Supply Corps or the Civil Engineer Corps.

Description of the Civil Engineer Corps Option

In December, 1949, the Bureau of Naval Personnel in coordination with the Bureau of Yards and Docks approved a modification to the Naval Reserve Officers Training Corps Program. (61) This modification, known as the Civil Engineer Corps Option, provides a special program for regular Naval Reserve Officers Training Corps students who become candidates for commissions as Ensign, Civil Engineer Corps, United States Navy. The Civil Engineer Corps option contains the following principal elements:

(1) Candidates for the Civil Engineer Corps option will be selected from the Naval Reserve Officers Training Corps group during their second academic year. The number selected will not exceed 2.2% of the total national Naval Reserve Officers Training Corps class.

(2) Students taking the Civil Engineer Corps option will complete the same naval instructional program as the regular students, with the exception listed in the item below.

(3) During the second summer of their course the selected students will, in place of a cruise, attend a surveying session under naval jurisdiction.

A student to be eligible for the Civil Engineer Corps option must expect to receive a scientific degree in engineering in a course which is accredited by the Engineer's Council for Professional Development. Most of the candidates selected will be students in civil engineering, but a few will be selected who are enrolled in electrical and mechanical engineering.

Description of the Civil Engineer Corps

The Civil Engineer Corps of the United States Navy is composed of officers of the Navy who are directly responsible for the design, construction, alteration, inspection, and maintenance of the public works and public utilities of the shore establishment of the Navy (65). The officers of the Civil Engineer Corps administer the work of the Bureau of Yards and Docks, one of the seven administrative divisions of the Navy Department. Admiral Ben Moreel, CEC, USN, the wartime Chief of the Bureau of Yards and Docks, described the members of the Civil Engineer Corps as engineers, planners, estimators, constructors and analysts of shore facilities (60).

Civil Engineering duties in the Navy include construction and maintenance of shore facilities at such bases as Navy Shipyards, Air Stations, Ammunition Depots, Marine Barracks, Tank Farms, Hospitals, Submarine Bases, Radio Stations, Research Centers and others. Most of these duties require the professional application of a sound civil engineering education. In addition to the activities covered, officers of the Civil Engineer Corps while in charge of Naval Construction Battalions, commonly called "Seabees", construct and maintain base facilities in the combat zones. At the peak of World War II most of the 10,000 Civil Engineer Corps officers and 240,000 enlisted men were engaged in Seabee duties.

The Problem

The problem of selecting the best fitted candidates for the Civil Engineer Corps option in the Naval Reserve Officers Training Corps program was investigated in this study. Although all regular students in the Naval Reserve Officers Training Corps program have been carefully screened upon admittance, this screening was on the basis of their general qualifications and was not intended to measure the ability of the student to excel in a particular field such as civil engineering (59). It was the purpose of this thesis to propose a selection program which would select the best fitted candidates for the Civil Engineer Corps option.

The problem was delimited to a study of all related research materials from both civilian and military sources

together with an analysis of the relationship and application of this material to the proposed selection program. No original research data was collected since the Civil Engineer Corps option will not be placed in operation until mid-1950 (61) and no subjects were available for study. No other similar group was available for an original research study.

Need and Timeliness of this Study

The first group to follow the Civil Engineer Corps option will be selected in mid-1950. The final selection will be by a board composed of Civil Engineer Corps officers meeting in the Navy Department (61). This study will be of value to the present board and future boards in evaluating each applicant's record and in making their final selection.

Definition of Terms

"Engineering, broadly defined, is the combination of Art and Science by which materials and power are made useful to mankind." (14)

"Civil Engineers design and supervise the construction of such facilities as roads, railroads, buildings, tunnels, bridges, dams, canals, water-supply and sewerage systems--they operate in the field of surveying, with its many branches. Most of the stationary structures erected to serve mankind are the proper concern of the Civil Engineer." (14)

"Success in one's career is attained when one, with a consciousness of having served mankind worthily, acquires a

competence and receives the approbation of one's fellow workers." (58)

"Aptitudes indicate potentialities." (4)

Interest -- "A propensity to attend to and be stirred by a certain class of objects." (51)

Criterion -- "The term criterion is applied to a performance measure which is used as a standard in evaluating other measures." (53)

Officer-like Qualities -- "Demonstration of the leadership and social qualities required of a responsible naval officer." (63)

Summary

The United States Navy obtains most of its officers from one of two sources, the Naval Academy and the Naval Reserve Officers Training Corps Program.

The Naval Reserve Officers Training Corps Program for regular midshipmen was established in 1946 to provide for training of career officers of the Regular Navy. The appointment of men for this program was based on a national selection system which included a national aptitude test, physical examination and personal interviews. Final selection was by State Committees. The Naval Reserve Officers Training Corps Program provides for a four-year Navy-subsidized college education. Upon graduation the men are commissioned Ensigns in the Line, Supply Corps or Civil Engineer Corps of the

Regular Navy or are commissioned Second Lieutenants in the Marine Corps.

In December, 1949, a modification was made in the Naval Reserve Officers Training Corps Program to provide special training for students who become candidates for commissions as Ensign, Civil Engineer Corps, U.S. Navy.

The problem as investigated by this study was to establish a selection program to select the best fitted candidates for the Civil Engineer Corps option.

CHAPTER II

ANALYSIS OF THE PROBLEM AND TECHNIQUES FOR SOLUTION

Job Analysis

What is the job to be filled by the candidate selected? First, he must be a student of sufficient ability to graduate in an engineering course. Graduation in engineering with a scientific degree is required before he can be commissioned in the Civil Engineer Corps (61). Upon graduation he must have acquired the leadership and social qualities required of a responsible naval officer (63). His duties as a Naval Civil Engineer after graduation will place him in responsible charge of design, construction, alteration, inspection and maintenance of public works and public utilities in the Navy's shore establishment (65).

An analysis made in April, 1949, of the duties performed by 808 Civil Engineer Corps officers is shown in Tables I and II (30).

TABLE I

DISTRIBUTION BY TYPES OF DUTY TO WHICH ASSIGNED

Public Works Departments[a]	57%
Staff Functions[b]	20%
Construction Battalion Activities	8%
In School under Instruction	8%
Unavailables and Contingents	7%
	100%

a. Including District Public Works Offices

b. Including Bureau of Yards and Docks

TABLE II

DISTRIBUTION BY TYPES OF WORK (Estimated)

General Public Works Administration[a]	67%
General Engineering Advising (Staff)	10%
Personnel and Training	4%
Research Administration	2%
Design Administration	2%
In Schools under Instruction	6%
Unavailables and Contingents	7%
	100%

a. Including contracts and construction battalions

Tables I and II indicate the Civil Engineer Corps Officer must be a thoroughly qualified engineer and have the leadership and social qualities required of a naval officer in an important administrative position.

Criterion of Success

The criterion of success for the candidates selected must include the factors mentioned in the job analysis. These include the following:

(1) Success as a student in an engineering course.

(2) Demonstration of the qualities of leadership and social ability required of a responsible naval officer.

(3) Success as a graduate engineer in the practice of his profession.

The first two measures of success were directly considered in the study. However, the third measure was considered only indirectly. The amount of research available on the

success of engineers after graduation was very limited. The research available tended to directly relate the success of an engineer in the practice of his profession to his success as a student in an engineering course. Kandel said, "It is possible to predict success in studies but there are too many imponderables to predict success in practice, however, ability to succeed in studies is one measure of later success." (24) Pierson, in a study made on 463 graduates of the University of Utah, reported a correlation of .43 between standing in college work and later success in the engineering profession. His report indicated that a student with high grades was fourteen times more likely to be declared successful than was a student with average grades (40). Williams said, "A student successful with mathematics, physics and chemistry had the ability to study and practice engineering successfully." (58) The Engineer's Council for Professional Development reported intelligence to be the most desired personal characteristic in a survey of 44 high ranking executives who employed young engineers (15). One firm (American Telephone and Telegraph Company) which employed large numbers of young engineers, made studies over a period of years, and discovered that, in general, the men who progressed most rapidly in the company were those who had made good marks in college (1).

The criterion of success as used for this study was graduation in engineering, with high scholastic grades and evidence of officer-like qualities. The criterion contained

two measures. Stuit said, "In some cases an acceptable criterion must contain more than one measure." (53) The criterion was not limited to graduation in a particular field such as civil engineering. Although the majority of the candidates selected will be civil engineering students, some will be following electrical and mechanical engineering. However, this fact had little bearing on the selection program. Williams said, "If one has the ability requisite of one branch of engineering, one has the ability generally for any other branch as well, since the type of abilities is essentially the same for almost any branch that one might choose to enter." (58)

Methods to Determine Predictive Measures

To determine predictive measures for the first half of the criterion (graduation in engineering with high scholastic grades) related research was investigated concerning the following factors:

(1) Preparatory school grades.
(2) Aptitude tests.
(3) Interest tests.
(4) Personality tests. (of the paper and pencil type)
(5) Freshmen and Sophomore college grades.
(6) Grades in certain college subjects.

To determine predictive measures for the second half of the criterion (evidence of officer-like qualities) the following factors were investigated:

(1) Patterned interview.

(2) Grades in Naval Aptitude.

(3) Grades in Naval Science.

(4) Personality Tests. (of the paper and pencil type)

In the case of each factor listed, the related materials were investigated to determine the extent of the research, the results of each study and its bearing on the criterion. Library reference materials from both civilian and military sources were utilized. In addition, data was supplied by the Navy Department, Bureau of Naval Personnel, concerning related research studies from their sources. Some information was supplied by the engineering societies and testing services.

From the results of the investigation of related research, the reasonably consistent and significantly correlated measures were determined. Some measures with low correlation with the criterion and high intercorrelation with other measures were dropped from further consideration. Other measures, although below desirable level of correlation with the criterion, were retained because of the uniqueness of their measurement and because no more suitable measure could be found. Following this elimination process, the final list of predictive measures evolved.

Techniques to Establish the Selection Program

The problem, as stated in Chapter I of this study, was to determine a procedure to select candidates most likely to succeed in the Civil Engineer Corps option. In arriving at

the solution presented, heavy reliance was placed on interpretation of available related research materials. This methodology has been called "scientific insight" by Morris (35) (36). He further states that it is the rule rather than the exception in practical affairs, to have to use some method of solving a problem long before the efficiency of the chosen method can be accurately measured. This was true in determining a solution to the problem investigated by this study. Original research was not possible since subjects were not available. Subjects for original research would have to be of two classes (1) students in or graduates of the Civil Engineer Corps option, (2) graduates of the regular Naval Reserve Officers Training Corps program on active duty. These subjects were not available because the Civil Engineer Corps option was not yet in operation and because no graduates from the regular Naval Reserve Officers Training Corps program would enter the fleet until mid-1950.

Following the determination of the predictive measures, an interpretation of the relationship of each measure to the criterion was made. Based on this interpretation, the predictive measures were oriented into a selection program. An effort was made to make the individual items of the selection program simple, readily understood and with high face validity. The items were also designated in a manner to require a minimum of computational work on each candidate's record. The weighting of each item was assigned in

accordance with the interpretation of the relationship of that item to the criterion. In the weighting process, previous research by the Bureau of Naval Personnel in the initial Naval Reserve Officers Training Corps selection was considered.

Summary

A job analysis of the position indicates that a candidate with the following qualifications is required:

(1) He must be a student of sufficient ability to graduate in an engineering course.

(2) Upon graduation he must have acquired the leadership and social qualities required of a responsible naval officer.

(3) After graduation he must be able to assume responsible charge of civil engineering duties in connection with the shore establishment of the Navy.

The criterion of success for the candidate selected should include these factors:

(1) Success as a student in an engineering course.

(2) Demonstration of the qualities of leadership and social ability, required of a responsible naval officer.

(3) Success as a graduate engineer in the practice of his profession.

Factors (1) and (2) were directly considered by this study. Factor (3) could not be directly considered since

insufficient data was available. It was, however, indirectly considered since factor (3) is directly related to factor (1).

The criterion of success accepted for this study was graduation in engineering with high scholastic grades and evidence of officer-like qualities.

Predictive measures for the first half of the criterion (graduation in engineering with high scholastic grades) was determined by an investigation of related research for the following factors:

(1) Preparatory school grades.

(2) Aptitude tests.

(3) Interest tests.

(4) Personality tests.

(5) Freshman and Sophomore college grades.

(6) Grades in certain college subjects.

Predictive measures for the second half of the criterion (evidence of officer-like qualities) was determined by an investigation of the following factors:

(1) Patterned interviews.

(2) Grades in Naval Aptitude.

(3) Grades in Naval Science.

The final selection program was based on an interpretation of the relationship of each predictive measure to the criterion. The weighting of each item in the selection program was based on an interpretation of the relationship of

that item to the criterion plus consideration for previous research done by the Bureau of Naval Personnel on the initial Naval Reserve Officers Training Corps selection.

CHAPTER III

REVIEW OF RELATED RESEARCH

In the review of related research, only materials having bearing on predictive factors for engineering students who had already advanced to their sophomore year were considered. This limitation was fixed since all candidates for the Civil Engineer Corps option will be engineering students in their sophomore year. (61)

Preparatory School Grades

Most investigators reported that preparatory school grades were predictive of scholastic grades in engineering. They agreed, however, that for students who had completed one year in engineering other measures were more useful. Laycock and Hutcheon reported a correlation between twelfth grade high school marks and first year freshman studies equal to .61. (29) Pierson reported a correlation of .58 between high school grades and engineering grades. He says, however, that first year college grades are a better indicator of college scholastic success than high school grades. (40) Remmers and Geiger (41), and Kandel (24) agreed with this finding. A Veteran's Administration bulletin on predicting success in engineering reported that high school grades were indicative with correlations between .56 and .61. The

bulletin stated, however, that previous achievement in college engineering was an even better indicator. (55)

Aptitude Tests

The findings of related research studies on aptitude tests to predict success in an engineering course followed the same pattern as the findings concerning preparatory school grades. Aptitude tests were indicative of success in an engineering course but other scholastic measures were more useful. Cooprider and Laslett reported a study on the value of three different aptitude tests to predict success in four years of engineering studies. They found the correlations for the Stanford Scientific Aptitude Test to be .37, for the Engineering and Scientific Aptitude Test .39 and for the Q scale of the American Council on Educational Psychology Test .40. (9) A Veteran's Training bulletin reported the ability of certain aptitude tests to predict grades in freshman engineering subjects. The correlations were for the Ohio State Psychological Test .61, for the American Council on Educational Psychology Test .55, and for the Yale Scholastic Aptitude Test .58. (55) Wilson and Hodges reported a correlation between the Otis Intelligence Score and success in a four-year engineering course to be .43. (57) Stuit's study on naval officers, reported a correlation of between .32 and .43 on the ability of the Officers Classification Battery to predict success in difficult technical schools. (53) Brush reported the correlation of mechanical ability tests to success in a four-year

engineering course to be .30 to .54. (6) Laycock and Hutcheon found a correlation of .34 between the American Council's Psychological Test and the freshman marks in engineering. (29) Crawford and Burnham reported the typical correlation between intelligence tests and four-year college grades to be .40 to .50. (11) The Educational Testing Service reported a correlation for their Pre-Engineering Inventory with grades for the first three terms in engineering to be .38 to .58. (13) Flanagan found that an Army Officer's Test Form H-1 correlated .48 with grades in an Army engineer school. (18)

Interest Tests

Vocational interests are indicated to be of importance in selection by several investigators. Williams mentions the importance of combining interest and ability to produce success and happiness in engineering. (58) This opinion is confirmed by Mills in two studies. (33) (32) Pierson said, "The student's interest in engineering courses seemed to be an extremely important factor in determining survival." (40) Although most investigators agreed that interest was necessary for happiness on the job, they reported that interest scores and ability did not correlate very highly. Berdie reports a correlation of .13 between grade score in engineering and the Strong Vocational Interest Scale. (3) Some studies have shown the interest test to be easy to fake. Berdin showed by his studies that students could produce almost any interest pattern at will. He further stated that there was

little correlation between ability and interest. (5) Strong confirmed both these conclusions. (52) Strong in another study said, "Interest tests measure better the things we do not like than they do the things we like." (51) Harrell said that interest and job satisfaction are directly related. (20) Segel and Brintle reported a low correlation between interest scores and first year engineering grades. (46) Marsh reported the preparation of a Strong Vocational Interest Scale for naval civil engineers. He reported this scale would be of great use in selection of naval civil engineers. He found little correlation between interest and ability. (30)

Personality Tests

The amount of research on personality tests as a means of selecting engineering personnel was limited. This was probably due to the unsuccessful results obtained. Harrell reports personality tests to be unsatisfactory for selection. He said, "There is a high error in the validity of personality tests of the pencil-and-paper variety, in part because it is possible to fake them." (20) Bingham reported the difficulty of determining the personality essential to the job in question. (4) Office of Strategic Services reported unsuccessful use of prepared personality tests of the paper-and-pencil variety. (39) Poor results on using the Rorschach and the Thematic Apperception tests were reported by Flanagan (18) and Harrell. (20) Kornhauser carried out a study in which 100 psychologists

were questioned concerning the use of various tests. More than 85% agreed that personality inventories would be unsatisfactory. (26)

Freshman and Sophomore College Grades

Studies on the ability of freshman and sophomore college grades to predict scholastic success were consistent in the high value found for these measures. Wilson and Hodges found a correlation of .61 between freshman grades in engineering and scholastic success. (57) Remmers and Geiger reported a correlation of .68 between freshman-sophomore grades and final scholastic standing in engineering. (41) Table III indicates other findings on this study:

TABLE III

CORRELATIONS OF SCHOLASTIC INDICES

	N	r
Freshman first semester vs second semester	1036	.75 ± .01
Freshman first semester vs senior year	631	.56 ± .02
Freshman first year vs senior year	631	.61 ± .02
Sophomore first year vs senior year	631	.67 ± .01
Junior year vs senior year	631	.78 ± .01
Freshman and sophomore years vs senior year	631	.68 ± .01
Freshman, sophomore and junior vs senior year	631	.74 ± .01

Table III indicated that the correlation between freshmen grades and later grades began with a high of .75 and decreased as successive semesters were predicted. Brush reported a correlation of .85 between first year grades and

final scholastic standing. (5) Siemans found a correlation between lower division engineering grades and final standing in class of .70. (47) Pierson reported a .75 correlation between first year college grades and four year grades. (40)

Grades in Certain College Subjects

Various studies indicated that grades in certain college subjects had high value in predicting scholastic success. Higgins found a correlation of .84 between grades in engineering mathematics and success in an engineering course. He said, "In effect this study shows that students of superior mathematical ability will do superior work in the engineering school." (22) Wilson and Hodges reported a correlation of .63 between mathematics grades and final success in an engineering course. (57) Table IV indicates additional findings in the same study.

Table IV showed that while mathematics was a superior measure to other individual grades, it was only slightly better than the general freshman average as a measure to predict scholastic success. Kandel reports tests in mathematics to correlate .65 to .75 with engineering grades. (24) Siemans found that grades in mathematics correlated .69 with four-year college grades. (47)

TABLE IV

CORRELATION COEFFICIENTS PREDICTING ADVANCED SCHOLASTIC SUCCESS OF 107 ENGINEERING STUDENTS

	Criterion	1	2	3	4	5	6	7	8
1	Adv. Eng. Grades		.584	.276	.830	.453	.356	.611	.400
2	Freshman Eng.	.584		.383	.535	.400	.466	.738	.282
3	Freshman English	.276	.383		.518	.378	.459	.781	.288
4	Freshman Math.	.830	.535	.518		.379	.393	.816	.420
5	Freshman Mech. Draw.	.453	.400	.378	.379		.289	.573	.406
6	Freshman Chemistry	.356	.466	.459	.393	.289		.680	.084
7	Gen. Freshman Average	.611	.738	.781	.816	.573	.680		.382
8	Otis Score	.400	.282	.288	.420	.406	.084	.382	

Patterned Interview

Research on interviews as a method of selection has produced a wide range of results. As the interview techniques became more systematized and the interviewers better trained, consistently better results were reported. Charters said that appearance and manners, likeableness, attitudes, outside interests, hobbies, forcefulness, brightness in conversation and disagreeable mannerisms could be measured in an interview. (7) Moss reported interviews to be of only limited success in the selection of medical students. (37) Smeltzer and Adams prepared a graphic interview report to measure physical characteristics, personality and general aptitude for work. (48) Rundquist reported a study in which the Army Adjutant General's Office found interviews only reliable to measure ability to deal with other people. They found a validity of .37 in this study. (42) Stuit found interview techniques to be uncertain. (53) McMurray reported good results with the use of the patterned interview. (31) Finch described the use of the patterned interview by the New Jersey State Highway Department. (17) Wagner, in a lengthy study on the employment interview, gave several examples of poor results obtained in interviews. He said interviews should only be used to measure traits that could not be measured by other means. He reported best results were obtained with patterned interviews. (56) Morris reported the poor results obtained in the British Army with poorly organized interviewing. (35) The Navy Department outlined a carefully developed

patterned interview system be used in the selection of regular Naval Reserve Corps Midshipmen. The system involved the use of reference questionnaires by experienced interviewers in a specially patterned interview to measure the applicant's social personality, his potentialities of leadership and the likelihood of his developing into a responsible naval officer. (63) The Navy Department reported a reliability of this patterned interview system of .785. (64)

Grades in Naval Aptitude

Research on grades in naval aptitude or aptitude for the service as assigned regular midshipmen in the Naval Reserve Officers Training Corps was limited. The first regular midshipmen entered the program in 1946 (59) and the first class will be entering the fleet in 1950. As yet, no studies on this group concerning their abilities as young naval officers have been possible. Research on the correlation between grades in naval aptitude and performance as commissioned officers is necessary. Hust, in a study of the Naval Reserve Officers Training Corps at Yale University, found a reliability for naval aptitude marks as assigned by the staff of the Professor of Naval Science as follows: (43)

(1) First term freshman naval aptitude vs second term freshman naval aptitude = .88

(2) First term sophomore naval aptitude vs second term sophomore naval aptitude = .72

(3) Freshman naval aptitude vs
Sophomore naval aptitude = .34

Rust also reported the reliability of the cruise aptitude marks assigned during a six to eight weeks summer cruise. He reported as follows: (43)

(1) Sophomore cruise aptitude vs
Junior cruise aptitude = .40

(2) Freshman naval aptitude vs
sophomore cruise aptitude = .06

(3) Sophomore cruise aptitude vs
Sophomore naval aptitude = .39

(4) Sophomore naval aptitude vs
Junior cruise aptitude = .41

Rust found a low correlation between academic predictors and both naval aptitude and cruise aptitude grades. He found that interviews and personality ratings correlated considerably higher with aptitude marks than did academic predictors. (43) Latta, in a study of 69 midshipmen at Iowa State College, investigated the correlation between naval aptitude and the four factors used in the national selection program. He reported the correlations as follows: (28)

(1) With National Aptitude Test =-.005

(2) With high school grades = .38

(3) With first interview =-.0002

(4) With second interview = .05

Grades in Naval Science

Research on grades in naval science was limited by the same reasons cited for naval aptitude grades. Rust found the correlation between naval aptitude and naval science to vary from -.15 to .69. (45) He reported these correlations somewhat confusing. Rust also reported little or no correlation between naval science grades and interview and personality ratings. He found better correlation between naval science grades and academic predictors. (43) Latta reported the correlation of grades in naval science with the four factors used in the national selection program as follows: (28)

(1)	With National Aptitude Test	= .13
(2)	With high school record	= .33
(3)	With first interview	= .03
(4)	With second interview	= .07

Summary

The review of related research was confined to material having bearing on engineering students who had advanced to their sophomore year.

Investigation revealed that preparatory school grades were predictive of scholastic success in engineering but that other measures were more useful.

Findings concerning aptitude tests were similar to those for preparatory school grades. Aptitude tests were found to be predictive but for sophomore engineering students other measures were more useful.

Research on interest tests revealed that there was little or no correlation between interest and aptitude. Although not useful for predicting aptitude, interest tests were reported important in measuring job satisfaction.

Research on personality tests of the paper-and-pencil type revealed that little use could be made of this type of test for a selection program.

Studies on freshman and sophomore grades indicated that they were consistent, highly correlated measures for prediction of scholastic success in engineering.

Research on grades in certain college subjects demonstrated that grades in college mathematics were highly correlated to scholastic success in engineering.

Results of studies on interview techniques indicated that most interview practices were unsatisfactory. However, the use of patterned interviews for selection purposes was reported satisfactory.

Research on grades in naval science and naval aptitude was limited. The limited material available revealed that naval aptitude was related to personality factors while grades in naval science subjects appeared related to scholastic ability.

CHAPTER IV

INTERPRETATION OF DATA

Predictive Measures of Scholastic Success

The predictive measures of scholastic success in an engineering course as covered by this study included the following:

(1) Preparatory school grades.

(2) Aptitude tests.

(3) Interest tests.

(4) Personality tests.

(5) Freshman and sophomore grades.

(6) Grades in certain college subjects.

The review of related research indicated that neither interest tests nor personality tests of the paper and pencil type could be used to predict scholastic success. Table V indicates the ability of the remaining four factors to predict scholastic success.

Table V indicates that freshman college grades or freshman plus sophomore college grades are superior predictors of later scholastic success in an engineering course. Table V further indicates that grades in college mathematics are also superior predictors of scholastic success in engineering. Table V indicates that average correlations of the following order may be expected:

TABLE V

PREDICTION OF SCHOLASTIC SUCCESS IN AN ENGINEERING COURSE

Factor	Criterion	Correlation	Source
Freshman Grades	4 yrs. Engineering	.61	(57)
Freshman and Sophomore Grades	4 yrs. Engineering	.68	(41)
Freshman Grades	4 yrs. Engineering	.61	(41)
Freshman Grades	4 yrs. Engineering	.85	(6)
Freshman and Sophomore Grades	4 yrs. Engineering	.70	(47)
Freshman Grades	4 yrs. Engineering	.75	(40)
Mathematics Grades	4 yrs. Engineering	.84	(22)
Mathematics Grades	4 yrs. Engineering	.63	(57)
Mathematics Grades	4 yrs. Engineering	.65 to .75	(24)
Mathematics Grades	4 yrs. Engineering	.69	(47)
Prep. School Grades	Freshman Engineering	.61	(29)
Pre. School Grades	4 yrs. Engineering	.58	(40)
Aptitude Test	4 yrs. Engineering	.37 to .40	(9)
Aptitude Test	4 yrs. Engineering	.43	(57)
Aptitude Test	4 yrs. Engineering	.30 to .54	(6)
Aptitude Test	Freshman Engineering	.34	(29)
Aptitude Test	4 yrs. Engineering	.40 to .50	(11)

(1) Freshman grades vs 4 years engineering = .68

(2) Freshman and sophomore grades vs 4 years engineering = .70

(3) Mathematics grades vs 4 years engineering = .72

Based on these findings it would appear that freshman or freshman plus sophomore college grades and college mathematics grades are the best predictors of scholastic success in engineering. Remmers and Geiger said, "After the first semester the student's scholastic achievement is a much better predictive basis than any other available fact or set of facts about him. (41) Brush reported, "First semester and first year grades are more closely correlated with the total engineering college record than is any test or combination of tests." (6) Pierson said, "The simple grade-point ratio is an index of considerable importance in selecting and guiding prospective engineers." (40) In support of college mathematics grades as a superior predictor, Kandel said, "The general trend of the investigations seem to indicate that at present mathematical ability is the best measure of predicting success in a college engineering course." (24) Higgins reported, "In effect this study shows that students of superior mathematical ability will do superior work in the engineering school." (22) Foche reported that grades in college mathematics were the best predicator of scholastic success in engineering. (19) Wilson and Hodges (57) and Hayes (21) confirmed these findings. Krathwohl said, "Lack

of mathematical ability is certainly a reason, if not the main one, why students drop out of engineering schools." (27)

Predictive Measures of Officer-like Qualities

The review of related research indicated the limited nature of the material available on prediction of officer-like qualities. All naval writings on officer selection stressed the importance of selecting men with officer-like qualities. Officer-like qualities has been defined as--" Demonstration of the leadership and social qualities required of a responsible naval officer." (63) The United States Naval Institute reported naval leadership to be composed of the following factors: (66)

(1) Loyalty to Country
(2) Courage
(3) Honesty
(4) Common Sense
(5) Confidence
(6) Initiative
(7) Tact, Humor, Modesty
(8) Energy, Enthusiasm and Perseverance

They further said that a naval officer must be a gentleman. Gentleman was defined as:

> A man that is clean inside and outside, who neither looks up to the rich, nor down on the poor; who can lose without squealing; who can win without bragging; who is considerate of others; who is too brave to lie; too generous to cheat, and too sensible to loaf; who takes only his share of the world's goods and lets other people have theirs--this a real gentleman. (66)

The factors contributing to officer-like qualities were of a personal nature and difficult to measure and predict. (63)

This was verified by the related research materials. The related research studies indicated that grades in naval science were related to scholastic ability and did not measure officer-like qualities. Personality tests of the paper and pencil type were reported to be unsatisfactory. The remaining factors, patterned interviews and grades in naval aptitude had face validity for the prediction of officer-like qualities but had produced few measurable results. The establishment of validity coefficients for these two factors to measure officer-like qualities was not possible. The demonstration of these qualities would be delayed until the first class entered the fleet in 1950. The patterned interview prepared by the Navy Department for the national selection program followed the form of the best interviewing techniques. Other interview programs using a similar technique had reported good results as noted in the review of related materials. The Navy Department reported a high reliability coefficient for its patterned interviews. Reasonable reliability coefficients were reported for most naval aptitude grades assigned by the Professor of Naval Science. However, the reliability of naval aptitude grades assigned during training cruises were below desired levels.

Although both factors had weaknesses they were the best predictors available and had been specially designed to predict officer-like qualities. The Navy Department instructed the interviewer in the national selection program, "to judge

the applicant's social personality--his potentialities for leadership, how well he gets along with people, his likelihood of keeping out of trouble and of developing into a responsible naval officer." (63) Concerning the naval aptitude marks, the Navy Department said each midshipman was to be observed closely by the Professor of Naval Science and the officers of his staff, for the qualities considered most desirable in a young naval officer. The following factors would be noted: (62)

(1) Conduct
(2) Leadership
(3) Interest
(4) Initiative and industry
(5) Cooperation
(6) Military bearing and neatness
(7) Performance of duty
(8) Military courtesy

It would appear that the Navy Department intended that the national selection interviews and the grades in naval aptitude measure officer-like qualities.

Since the national selection interviews and the grades in naval aptitude were the best predictors of officer-like qualities available, they were included in the selection program proposed by this study.

Predictive Value of Interest Tests

The review of related research indicated that interest tests had low correlation with ability. Several investigators reported, however, that interest was necessary for proper job satisfaction. It was also reported that interest tests

were easy to fake and in some cases measured better the things we disliked than the things we liked. These findings would indicate that interest tests should be used only as a restrictive measure in selection and not in a competitive sense of producing the highest score.

Summary

An interpretation of the data taken from related research studies indicated that:

(1) Interest and personality tests (of the paper and pencil type) could not be used to predict scholastic success.

(2) Preparatory school grades and aptitude tests were predictive of scholastic success but that other measures were better.

(3) Freshman college grades or freshman plus sophomore college grades were superior predictive measures.

(4) College mathematics grades were equally as useful as predictive measures of scholastic success.

(5) The national selection interviews and grades in naval aptitude were the best predictors of officer-like qualities.

(6) Interest is important to job satisfaction and that interest tests should be used only in a restrictive sense in a selection program.

CHAPTER V

THE SELECTION PROGRAM

Selection Factors

The program to select candidates for the Civil Engineer Corps option was designed to include the factors that were found to be most significantly correlated with the criterion. In determining the selection factors the criterion (graduation in engineering, with high scholastic success and evidence of officer-like qualities) was divided into two parts. The first part studied was the prediction of scholastic success and the last part was the prediction of officer-like qualities.

The factors found to correlate most significantly with scholastic success were:

(1) All college grades to date. -- This was a rewording of the factor freshman grades or freshman plus sophomore grades which was found to be one of two factors most significantly correlated to scholastic success.

(2) College mathematics grades to date. -- This was the other factor found to correlate most significantly with scholastic success.

The factors found to be the best predictors of officer-like qualities were:

(1) Scores on the national selection interviews. -- These were the scores established by each midshipman at the time of his original selection in the national selection program.

(2) Grades in naval aptitude. -- These were the grades assigned by the Professor of Naval Science for naval aptitude during the school year plus the grades assigned in naval aptitude during a summer cruise.

Weighting the Factors

Since insufficient data was available to determine the proper weighting of each factor by statistical methods, it was necessary to make a generalization from the weighting used in the national selection program together with consideration for the interpretation placed on the related research data in establishing weights for the proposed program.

The Navy Department in the national selection program used the following factors with the weights noted: (63)

Factor	Weight
(1) National Aptitude Test	4
(2) High school grades	4
(3) First interview	1
(4) Second interview	1

A study of the factors was reported by the Navy Department in which these weights were justified. (64) Table VI compares the factors and weights used in the national selection program to those proposed for the Civil Engineer Corps option.

TABLE VI

ASSIGNMENT OF FACTOR WEIGHTS

Factor	Predicts	Weight
National Aptitude Test	Scholastic success	4
*COLLEGE GRADES	SCHOLASTIC SUCCESS	(4)
High School Grades	Scholastic success	4
*COLLEGE MATHEMATICS GRADES	SCHOLASTIC SUCCESS	(4)
First Interview	Officer-like qualities	1
*NATIONAL SELECTION INTERVIEWS	OFFICER-LIKE QUALITIES	(1)
Second Interview	Officer-like qualities	1
*NAVAL APTITUDE GRADES	OFFICER-LIKE QUALITIES	(1)

*Items in capitals are from the proposed selection program.

Table VI demonstrates that the proposed selection program contains the same number of factors predicting the same abilities as the national selection program. Based on this agreement between the two programs, the factors for the proposed program were assigned weights found useful in the national selection program.

Computation of Selection Scores

In using the factor weights, it was necessary to provide a scale that would convert the scores on the four factors to a common base. This was accomplished by adopting the 0 to 10 scale used in the national selection program. (63) In using this scale, all the accomplishments of a candidate in a particular factor are considered; a candidate is then given a rating from 0 to 10 based on his indicated ability in that factor. To illustrate, if a candidate had all "A"

grades in mathematics he would be given an unweighted score of 10 in that factor. If he had all "C" grades in mathematics he would be given an unweighted score of 5 in the factor. These unweighted scores would then be multiplied by the factor weight to produce the score for that factor.

Table VII indicates a proposed chart to obtain each applicant's selection score.

Table VII will produce a weighted selection score for each candidate which can be used as a direct comparison with other candidates. Based on the interpretations of this study, the candidates with the highest selection score should be the candidates most likely to succeed in the Civil Engineer Corps option.

Use of the Interest Test

The interpretation of research data on interest and interest tests indicated that while interest tests did not satisfactorily measure ability, they could be useful in predicting job satisfaction. The ability to fake high scores on interest tests was reported. Considering this possibility, interest test scores were not included in the competitive portion of the selection program. However, considering the danger of job dissatisfaction, it would be inadvisable to select any candidate for the Civil Engineer Corps option who could not reach the minimum interest scores established in Marsh's study. (30)

TABLE VII

SELECTION SCORE

Unweighted Factor	Not Acceptable	Barely Acceptable	Below Average	Average	Above Average	Outstanding	Weight Assigned Score
	0 1 2	3 4	5	6 7	8	9 10	
College Grades							4
College Mathematics Grades							4
National Selection Interview							1
Naval Aptitude Grades							1
						Total Selection Score	-

Summary

Selection factors found to correlate most significantly with scholastic success were:

(1) College grades to date.

(2) College mathematics grades.

Selection factors found to correlate most significantly with officer-like qualities were:

(1) Scores on the national selection interviews.

(2) Grades in naval aptitude.

The program to select candidates for the Civil Engineer Corps option, as proposed, contained those factors weighted as:

Factor	Weight
(1) College grades	4
(2) College mathematics grades	4
(3) Scores on national selection interviews	1
(4) Naval aptitude grades	1

Based on the interpretations of this study, the candidates producing the highest selection scores from these weighted factors would be the candidates most likely to succeed in the Civil Engineer Corps option.

Candidates who could not reach minimum required interest test scores would not be considered for the Civil Engineer Corps option.

CONCLUSIONS

The solution to the problem as proposed by this study was based on interpretations made from available research materials. Under these conditions the adequacy of the solution is directly related to the quality and quantity of previous pertinent research data. In the case of some selection factors the conclusions were based on adequate clear-cut scientific data. This condition was not satisfactorily met for all factors considered.

The previous research materials to predict scholastic success were fairly adequate. Some inconsistencies existed and some relationships to the problem were vague. On the whole, however, the number of studies available furnished materials which allowed reasonable interpretations to be made. Original research on this portion of the problem should be made to confirm the conclusions reported here.

In establishing the criterion of this study, mention was made of the relationship between scholastic success and later achievement in practice. Further study on the graduates of the Civil Engineer Corps option should be made to confirm this relationship.

The previous research materials available to predict officer-like qualities were inadequate. This appeared to be the result of the uncertainty of what officer-like qualities represented and the inability to provide definite

factors to measure these qualities. This portion of the problem was the most difficult. The factors involved appeared to be of a personal nature and were in the indefinite region of all personality measurements. However, additional research on this portion of the problem is greatly needed. The factors presently available for measuring officer-like qualities were demonstrated to be of varying reliability and uncertain validity. The measurement of officer-like qualities is important and for proper selection should be accurately determined. Additional research in this area would add greatly to improving selection procedures for officers in all branches of the naval service.

BIBLIOGRAPHY

BIBLIOGRAPHY

1. American Association of Engineers, Vocational Guidance in Engineering Lines. Easton, Pennsylvania: Mack Printing Company, 1933.

2. Bellknap, J. H., "The Naval Reserve Officers Training Corps Program in the Engineering Colleges," Journal of Engineering Education, Vol. 38 (Dec. 1947).

3. Berdie, R. F., "Prediction of College Achievement and Satisfaction," Journal of Applied Psychology, Vol. 28 (June 1944).

4. Bingham, W. V., Aptitudes and Aptitude Testing. New York: Harper & Bros., 1937.

5. Bordin, E. S., "A Theory of Vocational Interests as Dynamic Phenomena," Educational and Psychological Measurements, Vol. 3 (1943).

6. Brush, E. N., "Mechanical Ability as a Factor in Engineering Aptitude," Journal of Applied Psychology, Vol. 25 (June 1941).

7. Charters, W. W., "The Discovery of Executive Talent," Annual Convention Series, American Management Association, Vol. 69 (1927).

8. Conrad, H. S. and Satter, G. A., "The Use of Test Scores and Quality Classification Rating in Predicting Success in Electricians Mates School," OSRD, 1945: Publication Board #1329. Department of Commerce, Washington, D.C., 1946.

9. Cooprider, H. A. and Laslett, H. R., "Predictive Values of the Stanford Scientific and the Engineering and Physical Science Aptitude Tests, Educational and Psychological Measurements, Vol. 8 (1948).

10. Crawford, C. W., Introductory Problems in Engineering. Chicago, Ill.: Irwin Farnham Publishing Co., 1947.

11. Crawford, A. B. and Burnham, P. S., Forecasting College Achievement. New Haven: Yale University Press, 1946.

12. Curtis, G. B. and Stoughton, B., "Control and Stabilization of Enrollment," Journal of Engineering Education, Vol. 29 (April 1939).

13. Educational Testing Service, "The Pre-Engineering Inventory as a Predictor of Success in Engineering Colleges," The College Entrance Examination Board. (August 1949).

14. Engineers Council for Professional Development, Engineering as a Career. New York: ECPD, 1942.

15. Engineers Council for Professional Development, The Most Desirable Personal Characteristics. New York: ECPD, 1948.

16. Failor, C. W. and Mahler, C. A., Examining Counselor's Selection of Tests," Occupations, Vol. 28 [illegible]3 (Dec. 1949).

17. Finch, J. K., Trends in Engineering Education. New York: Columbia University Press, 1948.

18. Flanagan, J. C., Chairman, "Psychological Research in the Armed Forces," Review of Educational Research, Vol. 18 [illegible]6 (Special Edition).

19. Focke, T. M., Chairman, "Preliminary Report of the Committee on Coordination of Preparatory and Engineering Education," Journal of Engineering Education, Vol. 20 (Jan. 1930).

20. Harrell, T. W., Industrial Psychology. New York: Rinehart and Co., Inc., 1949.

21. Hayes, J. M., "Mathematics in Civil Engineering," Journal of Engineering Education, Vol. 38 (Nov. 1947).

22. Higgins, T. J., "Study of Mathematical Ability in Relation to Success in Engineering Studies," Journal of Engineering Education, Vol. 23 (1932-33).

23. Horton, S. P., "A Follow-up of the Careers of Tested Engineering Students," Human Engineering Laboratory, Inc. Technical Report [illegible]97, Vol. 1 and 2 (Nov. 1941).

24. Kandel, I. L., Professional Aptitude Tests in Medicine, Law and Engineering. New York: Teachers College, Columbia University, 1940.

25. Koerper, E. C., "Milwaukee Plan of Aptitude Testing," Journal of Engineering Education, Vol. 39 (June 1949).

26. Kornhauser, Arthur, "Replies of Psychologists to a Short Questionnaire on Mental Test Development, Personality Inventories and the Rorschach Test," Educational and Psychological Measurements, Vol. 5 (1945).

27. Krathwohl, W. C., "Predictions of Average Class Achievement by Means of Aptitude Tests," Journal of Engineering Education, Vol. 37 (Nov. 1946).

28. Latta, A. W., "Prediction of Naval Officer Aptitude and Naval Orientation Achievement at the Iowa State College." Unpublished Master of Science thesis, Iowa State College, 1949.

29. Laycock, S. R. and Hutcheon, N. B., "A Preliminary Investigation into the Problem of Measuring Engineering Aptitude," Journal of Educational Psychology, Vol. 30 (1939).

30. Marsh, J. S., "Selection of Civil Engineer Corps Officers--U. S. Navy." Unpublished Master of Arts thesis, Stanford University, Stanford, California, 1949.

31. McMurray, R. N., "Validating the Patterned Interview," Personnel, Vol. 23 (Jan. 1947).

32. Mills, John, "Aptitudes and Engineering Careers," Mining and Metallurgy, Vol. 28 (July 1947).

33. Mills, John, The Engineer in Society. New York: D. Van Nostrand Co., 1946.

34. Moore, B. V., "Personnel Selection of Graduate Engineers," Psychological Monographs, Vol. 30 #5 (1921).

35. Morris, Ben S., "Officer Selection in the British Army 1942-1945," Occupational Psychology, Vol. 23 #4 (Oct. 1949).

36. Morris, Ben S., "A Reply to Colonel Ungerson," Occupational Psychology, Vol. 24 #1 (Jan. 1950).

37. Moss, F. A., "Scholastic Aptitude Tests for Medical Students," Journal of Association of American Medical Colleges, Vol. 6 (1931).

38. Moulthrop, M. K., "Navy College Aptitude Test," Higher Education, Vol. 5 (Dec. 1948).

39. Office of Strategic Services, Assessment of Men. New York: Rinehart, 1948.

40. Pierson, George A., "School Marks and Success in Engineering," Educational and Psychological Measurements, Vol. 7 (1947).

41. Remmers, H. H. and Geiger, H. E., "Predicting Success and Failure of Engineering Students in the Schools of Engineering in Purdue University," Purdue University Studies in Higher Education #38, Studies In Engineering Education. 1940.

42. Rundquist, E. A., "Development of an Interview for Selection Purposes," New Methods in Applied Psychology, Kelly, G. A., Editor, College Park, Md.: University of Maryland, 1947.

43. Rust, R. M., "The Predictive Value of Certain Tests and Ratings for NROTC Proformance." Unpublished Paper to the Department of Health, Yale University, 1949.

44. Sackett, R. L., The Engineer, His Work and His Education. Boston: Ginn and Co., 1928.

45. Segel, David, "Prediction of Success in College," U. S. Bureau of Education Bulletin #15. (1934).

46. Segel, David and Brintle, S. L., "The Relation of Occupational Interest Scores as Measured by the Strong Interest Blank to Achievement Test Results and College Marks in Certain College Subject Groups," Journal of Educational Research, Vol. 27 (Feb., 1934).

47. Siemens, C. H., "Forecasting the Academic Achievements of Engineering Students," Journal of Engineering Education, Vol. 32 (April 1942).

48. Smeltzer, C. H. and Adams, C. R., "A Comparison of Graphic and Narrative Interview Reports," Personnel, Vol. 13 #2 (1936).

49. Speer, G. S., "Vocational Interests of Engineering and Non-engineering Students," Journal of Psychology, Vol. 25, (April 1948).

50. Stewart, L. O., "Advice to Young Men Who Seek Careers in Civil Engineering," Journal of Engineering Education, Vol. 36 (Sept. 1945).

51. Strong, E. K., "The Role of Interests in Guidance," Occupations, Vol. 27 #8 (May, 1949).

52. Strong, E. K., Vocational Interests of Men and Women. Stanford, California: Stanford University Press, 1943.

53. Stuit, D. B., Personnel Research and Test Development in the Bureau of Naval Personnel. Princeton, N. J.: Princeton University Press, 1947.

54. Swain, G. F., The Young Man and Civil Engineering. New York: The MacMillan Co., 1922.

55. Veterans Administration, "Predicting Success in Engineering Training," Veterans Administration Training Bulletin 7-11. (Dec. 1946).

56. Wagner, Ralph, "The Employment Interview: A Critical Summary," Personnel Psychology, Vol. 2 #1 (Spring 1949).

57. Wilson, M. O. and Hodges, J. H., "Predicting Success in the Engineering College," Journal of Applied Psychology, Vol. 16 (August 1932).

58. Williams, C. C., Building an Engineering Career. New York: McGraw-Hill, 1946.

59. United States Navy Department, Bureau of Naval Personnel, "NROTC Bulletin of Information - Naval College Training Program," U. S. Navy Department, (August 1949).

60. United States Navy Department, Bureau of Yards and Docks, Building the Navy's Bases in World War II, Vol. I and II. Washington: U. S. Government Printing Office, 1947.

61. United States Navy Department, "Civil Engineer Corps - Modification to Naval Reserve Officers Training Corps Program," NROTC Bulletin 16-49.

62. United States Navy Department, "Regulations for the Administration and Training in the Naval Reserve Officers Training Corps," NavPers 15034C, (1947).

63. United States Navy Department, "NROTC Procurement Regulations," (1950).

64. United States Navy Department, "Preliminary Analysis of NROTC Selection," Letter by Bureau of Naval Personnel, 1949.

65. United States Navy Department, "United States Navy Regulations, 1948." Washington, D. C.: United States Government Printing Office, 1948.

66. United States Naval Institute, Naval Leadership. Annapolis, Maryland: United States Naval Institute, 1949.

APPENDIX

C O P Y

DEPARTMENT OF THE NAVY
BUREAU OF NAVAL PERSONNEL
WASHINGTON 25, D.C.

Pers-424-nd

12 Jan 1950

From: Chief of Naval Personnel

To: Chief of the Bureau of Yards and Docks

Subj: NROTC Civil Engineer Corps Option

Ref: (a) BuYAD ltr P11-1 A11O/1r of 13 Oct 1949
(b) NROTC Bulletin No. 16-49 of 22 Dec 1949

Encl: (1) 2 copies of reference (b).

1. In reference (a) the Chief of the Bureau of Yards and Docks recommended procedures for obtaining applicants for the NROTC Civil Engineer Corps option. Information concerning this option and procedures for applying for same were promulgated by means of reference (b), copies of which are enclosed herewith.

2. In reference (a) the Chief of the Bureau of Yards and Docks also recommended that an information sheet be promulgated to freshmen engineering students who are prospective candidates for the civil engineer corps option. Such information sheets will be promulgated in separate correspondence.

G. C. TOMER
By direction

C O P Y

DEPARTMENT OF THE NAVY
BUREAU OF NAVAL PERSONNEL
WASHINGTON 25, D.C.

Pers-424-nd

22 December 1949

NROTC BULLETIN NO. 16-49

From: Chief of Naval Personnel

To: Commandant, All Continental Naval Districts
Commandant, Potomac River Naval Command
All Professors of Naval Science

Subj: Civil Engineer Corps - Modification to Naval Reserve Officers' Training Corps Program.

Encl: (1) Sample Application form.

1. The Bureau of Naval Personnel, in coordination with the Bureau of Yards and Docks, has approved a modification to the NROTC Program to provide for the inclusion of a special program for regular students who are candidates for commissions as Ensign (CEC) USN. This modification consists of the following principal elements:

(a) Candidates for the CEC option will be selected for same during the second school year of their academic course. In no instance will the number of candidates to be selected exceed a maximum of 2.2% of the national total of regular students in each class. It is anticipated that selected midshipmen who successfully complete the program will be commissioned as Ensign (CEC) USN, subject to overall personnel limitations of the Corps as stipulated by the annual Personnel Allocation Plan.

(b) Students taking the CEC option will complete the same instructional program as prescribed for regular NROTC students, with the exception of summer training as described in sub-paragraph 1(c) and (d) below.

(c) During the second summer of their course selected students will, in place of aviation-amphibious indoctrination training, attend a summer surveying session under naval jurisdiction. This training will be conducted in conjunction with a regularly scheduled summer surveying session conducted by

C O P Y

an NROTC institution. Midshipmen will attend this summer training under rules and regulations similar to those in effect for summer cruises.

(d) During the third summer of their course selected students will participate in aviation-amphibious indoctrination training, in lieu of the ordinarily scheduled senior cruise.

2. Regular students eligible to apply for the CEC option must expect to receive a scientific degree in engineering in a course which is accredited by the Engineer's Council for Professional Development. Most of the candidates will be selected from students enrolled in Civil Engineering, but a few will be selected who are enrolled in other engineering fields, particularly Electrical and Mechanical.

3. Regular students desiring selection for the CEC option will submit application to the Bureau of Naval Personnel in time for such application to reach the Bureau prior to 1 March of their sophomore year. A form similar to Enclosure (1) will be used. The forwarding endorsement of the Professor of Naval Science will include such appropriate recommendations as will assist this Bureau and the Bureau of Yards and Docks in making final selections for the subject training, as well as the applicant's aptitude mark to date.

4. The following will be forwarded with the application:

(a) Transcript of academic work to date (including first semester or quarter of sophomore year)
(b) Completed Strong Vocational Interest Test
(c) Completed Officer Classification Battery (NavPers 16722-26)

5. The Officer Classification Battery is presently available at each NROTC Unit. Copies of the Strong Vocational Interest Test will be supplied by this Bureau upon request, should copies not be available at the Unit or Colleges concerned. Both tests will be graded by this Bureau.

6. Final selection of candidates will be made by a board composed of CEC officers. Selected candidates will be so notified, and will be ordered to summer training in accordance with paragraph 1 above. Detailed procedures for the CEC summer surveying session will be promulgated by separate correspondence.

F. W. McMAHON
Rear Admiral, USN
Deputy Chief of Naval Personnel

C O P Y

SAMPLE APPLICATION FORM

From: Midshipman Jack B. SURE, USNR, C-123456
To: Chief of Naval Personnel
Navy Department
Washington 25, D.C.

Via: Professor of Naval Science_____
(Name of School)

Subj: NROTC CEC Option; Application for.

Ref: (a) NROTC Bulletin No. 16-49

1. I hereby apply for the CEC option as outlined in reference (a). The following data is submitted:

Degree expected_____
(Be specific--B.S. in Electrical Engineering, etc.)

Date Degree expected_____

Surveying courses I will have completed by end of present academic year_____

_____
(Brief description, titles and credit values)

_____
(Signature)

NOTE: Following will be made enclosures to Professor of Naval Science forwarding endorsement:

(A) College transcript
(B) Completed Strong Vocational Interest Test
(C) Completed Officer Qualification Test Battery.

ENCLOSURE (1)

EXTRACT

NROTC PROCUREMENT REGULATIONS 1950
U.S. NAVY DEPARTMENT
BUREAU OF NAVAL PERSONNEL

1100 Public Law 729--79th Congress, an act "To provide for the training of officers for the naval service, and for other purposes," was approved by the President on 13 August 1946. In general, it provides for the procurement of male officer candidates, from civilian and naval sources, to be trained in colleges and summer cruises for eventual commissioning as officers of the Regular Navy and Marine Corps.

1200 The Naval Reserve Officers Training Corps Regular Student program trains officer candidates as Midshipmen, USNR, for line or staff corps duty, by providing four years of college training, with two summer cruises and one summer of aviation training at the end of which the student may be commissioned as an Ensign, USN, or Second Lieutenant, USMC, or with the rank of Ensign in the appropriate commissioned grade in such staff corps of the Navy in which the rank of Ensign is now or may hereafter be authorized.

1600 The instructions contained herein apply to the procurement of NROTC Regular students. Essentially the procedure is as follows:

(1) Candidates from civilian sources are selected in four stages as listed below:
   (a) A nationwide aptitude test will be given to all candidates.
   (b) Medical examinations and interviews will be given at designated CNOPs.
   (c) Final selection will be made by the State and Territorial Selection Committees.
   (d) The notification of candidates and their nomination to colleges will be effected by the Bureau of Naval Personnel.

2200 Specific Requirements

2201 No individual shall be enrolled in the NROTC unless:

(1) He is eligible for admittance to the NROTC college to which nominated and is accepted by the college within the college's NROTC quota.

(2) He is 17 years of age on or before 1 July of the calendar year of enrollment, and will be not more than 25 years of age on 1 July of the calendar year in which eligible for commission; i.e., he must have reached his 17th birthday on 1 July of the year of enrollment, and not have reached his 21st birthday by that date.

(3) He is physically qualified in accordance with the requirements of the current Manual of the Medical Department, USN, for entrance into the U. S. Naval Academy.

4000 PROCESSING OF APPLICANTS AT THE ONOPs.

4100 General.

4101. NROTC applicants who have obtained scores on the nationwide aptitude test above the national and state cutting scores will be further processed at the ONOPs. The lists of applicants qualified for further processing will be furnished to the ONOPs by the ETS in accordance with the provisions of Paragraph 3101(7).

4203 Each applicant called in to the ONOP for processing will have been instructed by the Letter of Notification to bring with him, properly filled out, the forms attached to the letter (with the exception of the reference questionnaire and high school record sheet), together with his college transcript (if applicable); birth certificate, evidence of citizenship (if required), and evidence of discharge from military or naval service (if applicable). The letter will have instructed him to give the three copies of the reference questionnaire to three adults well known to him (one of whom must have been his high school principal, head master, or similar official of the secondary school which he is currently attending or last attended), for them to complete and forward to the ONOP in franked, self-addressed envelopes supplied by the ONOP. The letter will also have instructed applicants who are enlisted in the Organized Reserve or enrolled as Contract NROTC students to give one copy of the reference questionnaire to their Commanding Officers or Professors of Naval Science, respectively. Similarly the applicant will have been instructed to deliver the High School Record Sheet (NavPers 923) together with Reference Questionnaire to the High School principal, head master or similar official, for him to complete and return to the ONOP with the questionnaire in the envelope provided.

(1) Reference Questionnaires received at the ONOP prior to the arrival of the applicant will be assembled with the related Record Sheets. The Reference Questionnaires should be examined before the interview in order to determine high-lights for discussion.

(2) High School Record Sheets received at the ONOP will be examined to insure that the student's rank in class is included. Inasmuch as the student's rank in class is the most accurate method known of determining relative rank between students from different schools, every attempt shall be made to obtain the rank. The High School Record Sheets which do not have the rank inserted shall (if time allows) be returned to the High School Principal with a letter calling attention to the fact that this rank is most important and that without it the candidate may be penalized in his competition with others. Rank by percentages is better than none at all, and in these cases the candidate shall be considered to be at the bottom of the percentage concerned.

4303 Applicants who pass the medical examination (See Article 4400) will then be interviewed and rated by two officers unless an additional interview is necessary because of a wide disparity between the two ratings.

(1) The Reference Questionnaires should be examined before the interview in order to determine highlights for discussion (See also Article 4203).

(2) The interviews shall be conducted as carefully as the time available permits, and every effort shall be made to accurately assess the person being interviewed.

(3) In giving the final rating, the interviewer shall follow the final paragraph of the NROTC Selection Interview Instructions (Appendix B) as accurately as possible. (It will be noted that no percentage of "not acceptable" candidates is given. The percentage of acceptable candidates should, however, follow the form very closely). For every candidate, the interviewing officer will write a one sentence impression of the candidate in the space above the signature. This will be considered extremely helpful by some of the selection committees. A major point to look for in the interview is motivation. This is admittedly hard to determine, but, in general, a candidate who honestly desires to make the Navy a career, even if mediocre in some other respects, is a better bet than a brilliant candidate who is merely looking for a free college education. Candidates who apparently lack the motivation should have it so noted on the bottom of the sheet.

(4) Upon conclusion of the interview, the interviewer's ratings will be recorded on the Record Sheet.

(5) No candidate will be rejected by the CNOP solely on the interview, and the papers of "not acceptable" candidates will, if physically qualified, be submitted to the Selection Committee along with those of "acceptable" candidates.

(6) A Professor of Naval Science or his Executive Officer, will normally be assigned to each CNOP during the processing period for assisting with the interviews. The Director or Officer-in-Charge will either act as the other interviewing officer, or designate another officer from the CNOP to do so. When temporary CNOPs are established for NROTC processing, Professor of Naval Science Interviewers will be assigned by the Bureau, and CNOP interviewers by the Director or Officer-in-Charge, for each individual case.

(7) In order to insure that all NROTC candidates are fully informed as to the educational requirements of the program, one of the interviewing officers (preferably the Professor of Naval Science) will inform the candidate as follows during the interview:

(a) While in college the NROTC student may take any course which leads to a baccalaureate or higher degree, with exception of the following:

Pre-Medical	Veterinary Medicine
Medicine	Pre-Theological
Pre-Dental	Theology
Dentistry	Pharmacy
Pre-Veterinary	Music and Art

(b) "As an NROTC student you will be required to take, in addition to the requirements of your major, 24 semester hours of Naval Science; you must have satisfactorily completed mathematics through trigonometry and one year of college physics by the end of your sophomore year; and you must achieve proficiency in written and oral expression in English, meeting the standards established by the college which you attend. If you have completed mathematics through trigonometry in secondary school, and, if mathematics is not required by the college for the course you will study (major), you will not be required to take mathematics under the NROTC Program. Students taking courses which do not require mathematics and physics, but who must take mathematics and physics to meet the above requirements, are advised that they will probably be confronted with scheduling difficulties and with an academic load that should only be attempted by outstanding students."

By so informing candidates during the interview, the numbers who resign on first reporting to their NROTC Units because of unacceptable workloads required will be reduced.

4500 Completion of Application Files and Other Records.

4501 Record Sheets.

(1) The top half will have been filled out by the applicant. If any information was missing, it will have been noted while the applicant was being processed, and should be received by the deadline date given to the applicant.

(2) The test score will have been filled in by the ETS prior to forwarding.

(3) The test score rating will have been filled in by the ETS.

(4) The Medical Examiner will check the proper box regarding physical qualifications.

(5) The High School Record rating will be determined from the High School Record and the School Record Conversion Chart. In the event that the principal or head master, to whom a High School Record has been returned for entry of the applicant's rank in the class, shall refuse to give the class standing, or a Record Sheet without a class standing is received too late for return to the principal, the following procedure shall be used:

(a) Evaluate his record on the basis of grades obtained and give him a rating as follows: Exceptional students (worth A's or in the 90's) a rating of 5; average students (worth B's or in the 80's) a rating of 3; mediocre students (mostly C's or in the 70's) a rating of 1; students in between may be given ratings 2 or 4 respectively, and poor students shall be given a rating of zero.

(b) No student will be given a rating higher than five. While this procedure may work to the disadvantage of some students

it is impracticable to give higher ratings inasmuch as there is no feasible method of determining relative ratings between the various high and prep schools.

(c) A student whose rating is determined by the above procedure shall have indicated on the High School Record Sheet that this method of determining his rating was used, in order that the Selection Committee shall be able to analyse this rating in its proper perspective.

(6) The two interview ratings will be scored as explained in the NROTC Selection Interview Instructions (Appendix B). In the event a third interview has been found necessary, the two highest ratings will be used on the Record Sheet.

(7) Each of the four ratings has been weighed. The test score weight is four, the high school record four, and the two interviews one each. The rating will be multiplied by the weight, and the results totaled in the box opposite the college record.

(8) The CNOP will not mark the college record, or the committee rating, as these will be done by the Selection Committee.

Extract

APPENDIX "A"

5. REFERENCE QUESTIONNAIRE (NavPers 919). Three (3) copies, with franked return envelopes.

The three reference questionnaires shall be given by you to three adults who are well-known to you as follows:

1. One shall be your high school principal or headmaster.
2. One shall be your employer, if not related to you. If you are not employed, this one may be given to any reputable citizen.
3. One shall be given to any reputable citizen.

APPENDIX "B"

NROTC SELECTION INTERVIEWS

Officers who will be assigned to conduct NROTC interviews will have two main jobs; first, they must evaluate the applicant on the basis of the statements and opinions in the Reference Questionnaire and the Application Blank; and second, they must observe the applicant in order to judge his social personality. There are some qualities of the applicant with which the interviewers need not be concerned. The candidate's general aptitude, for example, has been measured by the NROTC Selection Test; and only those individuals who are qualified will be seen by the interviewers. The interviewers, therefore, need make no judgment about the general brightness or mental aptitude of the applicant. Also, the applicant's educational scholarship record is obtained from the school itself and the interviewers need not concern themselves with it. And finally, the physical

qualifications of the applicant are tested by the medical examination. The big task which remains is to judge the applicant's social personality - his potentialities of leadership, how well he gets along with people, his likelihood of keeping out of trouble and of developing into a responsible naval officer. These are largely personal and social judgments and it is the interviewer's task to make them with the maximum possible insight. The general procedures and principles for accomplishing this task are described below.

(1) Appraisal of the Reference Questionnaire

In some cases, this materila will not be available to the interviewer prior to the interview. In any event, the interviewer's job is to note the ratings and comments contained on this questionnaire and to arrive at a general appraisal of their merit. If the ratings and comments about the applicant are uniformly and outstandingly favorable, the applicant probably deserves a double plus (//) rating. You should note whether the comments and ratings given by different individuals are in substantial agreement. Note also whether the comments appear to be carefully considered rather than sweeping generalities and cliches. Record your appraisal of the Reference Questionnaire on the Interviewers Appraisal Sheet by making a check in the appropriate box and by writing, briefly, an indication of the evidence on which this appraisal is based.

(2) Appraisal of the Application Blank

In rating the applicant from the evidence given in the Application Blank, you should note particularly the individual's participation in extra-curricular activities, hobbies, and work experience. The Application Blank should indicate the extent to which the applicant has participated and been a leader in various activities - athletics, student government, clubs and organizations, etc. If the Application Blank is filled out too sketchily to make such an appraisal, you will need to ask questions about it during the interview. The Application Blank should be judged for two main purposes; evidence of strong but well-balanced interests, and evidence of leadership. The applicant who is interested in several kinds of activity is judged superior to the applicant whose interests are more limited -- that is, participation in athletics and scholastic activities, in personal hobbies and social clubs may be regarded as evidence of well-balanced interests. If there is further evidence that the applicant has held positions of leadership in different kinds of activities, his Application Blank probably deserves a high rating. In some cases you will be able to appraise the Application Blank fairly with regard to these two elements (well-balanced interests, and leadership) without questioning the applicant during the interview. In other cases, you will need to get by direct questioning, further information about his kinds of interests and the extent of his leadership in various activities. Record your appraisal of the Application Blank on the Interviewers Appraisal Sheet by making a check in the

appropriate box and by writing, briefly, some indication of the evidence on which this appraisal is based, particularly in cases where additional facts have been brought out in the interview.

(3) The Interview

Part of the interview time may need to be used, as suggested above, to get additional facts about the applicant's interests and leadership so as to record a fair appraisal of his Application Blank. The main purpose of the interview, however, is to evaluate certain characteristics which are not adequately covered, or are indirectly covered, by the Reference Questionnaire and the Application Blank. Its purpose, essentially, is to obtain a judgment on how well the applicant gets along with people. It is designed to get a fresh appraisal of the applicant as an individual, to judge what sort of an impression he makes upon the interviewers who have no prior face-to-face contacts with him. The interview must be very informal and casual and the applicant must feel at ease. The interview is not a quiz. Two or three minutes of casual talk about such things as the weather, school, sports, new cars, etc., is a pretty good way to begin so as to help the applicant feel at ease. Following such introduction, the interviewer should introduce, smoothly and without any apparent transition, a conversational topic and observe what the applicant does with it. The purpose of the conversational topic is to develop a discussion of some problem in personal relation. Naturally, the applicant should do most of the talking, (with the interviewer observing and judging his behavior), noting how he speaks and behaves and the way he reacts rather than what he says. The discussion is developed by injecting new questions into the conversation (the so-called developing questions) which, in effect, change the situation or modify the conditions so that the applicant must talk further to bring the discussion to a close. Three examples of conversational topics and their development are described below, together with suggestions as to how these topics might naturally follow from the introductory two or three minutes of casual talk between the interviewer and the applicant.

Example 1.

Problem: Most people strike up casual conversation with strangers. How do you go about it? How do you introduce yourself?

Developing Question: What do you get out of these conversations? What is your feeling about picking up hitch-hikers?
About getting a lift yourself?
How do you disentangle yourself if you don't like the person?
What if you can't "shake" him?
What makes you like or dislike a person with whom you have struck up a casual conversation?

Suggested lead-in: You and the applicant have just faced the problem of how to start conversation. You can quite naturally say: "This business of striking up conversation with a stranger is certainly interesting. I suppose everybody has found himself in the situation where he has to start a conversation with someone he has never seen before. And I suppose each of us has a little different way of going about it. How do you usually introduce yourself and get a conversation started?"

Example 2.

Problem: What do you think makes for good "team spirit?"

Developing Questions: How would you know whether the "team spirit" was poor? If You were the coach, what would you do to raise the "team spirit?"

These conversational topics fall within the range of interest and experience of most applicants. It is recommended that you use one of them and that the discussion of it be concluded in about 5 to 10 minutes. It is permissable to invent new conversational topics provided they are discussed and approved by the several interviewers at the OMOP. Care must be taken to work out good developing questions. You should observe particularly how the applicant reacts to the developing questions for they introduce a new factor in the discussion and force the applicant to think of a new angle. Never disagree with the applicant. Your job is to watch how he behaves. Suggestion of things to look for are noted below:

Composure and Control: Look for nervousness, agitation, unnecessary movements, speech blocking, repetition verbosity.

Responsiveness: Look for readiness of replies, limitation of replies, amount of explanation, not answering, effort to satisfy.

Reasonableness and Objectivity: Look for use of qualifications, discrimination between fact and opinion, making and accepting corrections, leaning on authority, bluffing, hedging.

Effort to Understand: Look for attempts at definition, questions of verification, requests for clarification.

Word Selection and Usage: Look for use of simple English, technical words, colloquialism, slang, construction of sentences, clauses and phrases, narration and description, coherence and directness.

Voice Quality and Emphasis: Look for resonance, pitch, loudness, slurring, use of pauses, modulation, changes of rate.

Gestures and Expressions: Look for movements of mouth, eyes, eyebrows, forehead in smiling,

frowning, laughing, listening, talking; movements of head, hands, arms, shoulders.

Looks: Look for dress, features, carriage, posture in leaning, stretching, twisting, swaying.

In looking for and recording these characteristics and behavior you are to record your total impression of the applicant with respect to each of the eight factors listed. The impressions may be favorable, neutral, or unfavorable. Two levels of favorable impression (plus and doubleplus) are given as well as two levels of unfavorable impression (minus and double minus). You must decide whether the candidate makes a favorable or unfavorable impression on you, or whether he strikes you neither favorably nor unfavorably. If the impression he gives you is unfavorable, you must further decide whether it is just mildly or faintly unfavorable or whether it is definitely and distinctly unfavorable. If the impression on you is favorable, you must decide whether it is just mildly or pleasantly favorable or whether it is outstandingly and distinctly favorable. Under each of the eight factors in the Interviewers Appraisal Sheet you are expected to indicate briefly the evidence on which your impression is based. This is important. When the applicants' papers are up for final review, the reviewing officials desire to have some descriptive evidence accompanying each of your ratings.

(4) The Final Rating

When you have checked your impressions for each of the items on the Interviewers Appraisal Sheet you can quite easily see what sort of pattern they form.

This pattern of checks will suggest the general placement of the candidate on the Final Rating Scale. Thus, if all or nearly all of your checks are in the double plus (++) category, the applicant probably deserves a rating of nine (9) or of (10). Or, if all or most of your checks are in the double minus (--) category, the applicant probably deserves a rating of "not acceptable", or, at best, a rating of one (1) or two (2) on the scale. Remember, however, that a rating as low as one (1) is an acceptable rating and that any final rating of "not acceptable" should be checked only in the special box so labelled. Just below the Final Rating Scale you will see a series of percentages: these represent the approximate distribution of acceptable ratings which is expected. You are specifically cautioned against turning in a large number of outstandingly favorable and superior ratings. You must remember that all of the applicants you interview are presumably from the top half of the high school population; yet you must distinguish the good from the poor among this select group. Consequently, you are advised to be critical in checking your impressions lest you find a large majority of them tending to fall in the favorable categories. No mathematical formula can be given in advance by which you can translate automatically your impression on the several items to the Final Rating scale. The extremely high and extremely low ratings will be relatively easy to determine. Many of the others will be difficult.

But, as to whether the final rating for a given applicant should be a five (5) or a (6), no one at this stage of the game is in a better position than yourself to decide the answer. Two important suggestions can, however, be offered. First, at the end of each day's interviews tabulate the distribution of final ratings you have assigned and compare it with the expected percentages. Second, compare your final ratings with those of the other interviewer for the same candidates. If you disagree consistently and sharply, find out the reasons for your disagreement and arrive at a mutually acceptable understanding which will reduce the discrepancy in future ratings. Identical ratings of the same candidate by the two interviewers are not necessarily to be sought after, but nearly opposite ratings of the same candidate by the two interviewers, if persistent, suggest that the interviewers are not using the same basis in arriving at their judgments.

NAME (Last) (First) (Middle) FILE NO TYPE STUDENT NOW TAKING NS

PERIOD 11	COURSE	MARK	UNITS	POINTS
	CUMULATIVE TOTALS			

PERIOD 12	COURSE	MARK	UNITS	POINTS
	CUMULATIVE TOTALS			

PERIOD 13	COURSE	MARK	UNITS	POINTS
	CUMULATIVE TOTALS			

PERIOD 21	COURSE	MARK	UNITS	POINTS
	CUMULATIVE TOTALS			

PERIOD 22	COURSE	MARK	UNITS	POINTS
	CUMULATIVE TOTALS			

PERIOD 23	COURSE	MARK	UNITS	POINTS
	CUMULATIVE TOTALS			

PERIOD 31	COURSE	MARK	UNITS	POINTS
	CUMULATIVE TOTALS			

PERIOD 32	COURSE	MARK	UNITS	POINTS
	CUMULATIVE TOTALS			

PERIOD 33	COURSE	MARK	UNITS	POINTS
	CUMULATIVE TOTALS			

PERIOD 41	COURSE	MARK	UNITS	POINTS
	CUMULATIVE TOTALS			

PERIOD 42	COURSE	MARK	UNITS	POINTS
	CUMULATIVE TOTALS			

PERIOD 43	COURSE	MARK	UNITS	POINTS
	CUMULATIVE TOTALS			

PERIOD 51	COURSE	MARK	UNITS	POINTS
	CUMULATIVE TOTALS			

PERIOD 52	COURSE	MARK	UNITS	POINTS
	CUMULATIVE TOTALS			

PERIOD 53	COURSE	MARK	UNITS	POINTS
	CUMULATIVE TOTALS			

16— 59611-1

SIDE 2

CLASS STANDING COMPUTATION

PERIOD NO.	PERIOD DESCRIPTION	P NONNAVAL SCIENCE UNITS PASSED	U NONNAVAL SCIENCE UNITS UNDERTAKEN	W WEIGHTED GRADE TOTAL	G W/U	N NAVAL SCIENCE GRADES AND AVERAGES	A APTITUDE GRADES AND AVERAGES	S C+N+A WEIGHTED IN ACC'D LATEST INSTRUCTIONS	STANDING NO. IN CLASS
11									
12									
13									
14	AT END OF FOURTH CLASS YEAR	X	X	X	X	X			
20	THIRD CLASS CRUISE	*Enter cruise aptitude mark multiplied by 2 (semester schools) or 3 (quarter schools)*						X	
21									
22									
23									
24	AT END OF THIRD CLASS YEAR	X	X	X	X	X			
30	SECOND CLASS SUMMER	*Enter cruise aptitude mark multiplied by 2 (semester schools) or 3 (quarter schools)*						X	
31									
32									
33									
34	AT END OF SECOND CLASS YEAR	X	X	X	X	X			
40	FIRST CLASS CRUISE	*Enter cruise aptitude mark multiplied by 2 (semester schools) or 3 (quarter schools)*						X	
41									
42									
43									
44	AT END OF FIRST CLASS YEAR	X							
51									
52									
53									
54	AT END OF EXTRA TERM(S)								
00	NONNAVAL SCIENCE UNITS PASSED WHILE NOT ENROLLED IN NROTC								
60	TOTAL NONNAVAL SCIENCE UNITS								

NOTE: A STUDENT WHO RECEIVES AN "F" OR "FAILURE" FOR A NONNAVAL SCIENCE COURSE SHALL BE ASSIGNED A NAVY GRADE DETERMINED BY THE PROFESSOR OF NAVAL SCIENCE.

16—59611-1

SIDE 3

APTITUDE RECORD

FOURTH CLASS	THIRD CLASS	SECOND CLASS	FIRST CLASS
4.0	4.0	4.0	4.0
3.5	3.5	3.5	3.5
3.0	3.0	3.0	3.0
2.5	2.5	2.5	2.5
A	A	A	A
A	A	A	A
FINAL CRUISE APTITUDE	FINAL CRUISE APTITUDE	FINAL CRUISE APTITUDE	FINAL CRUISE APTITUDE

CRUISE RECORD

THIRD CLASS SUMMER	
SUMMER OF	
AT OR ON	
FROM	
TO	
SECOND CLASS SUMMER	
SUMMER OF	
AT OR ON	
FROM	
TO	
FIRST CLASS SUMMER	
SUMMER OF	
AT OR ON	
FROM	
TO	

SUMMARY OF CRUISE APTITUDE COMMENTS

SIDE 4

PHOTOGRAPH
2½ x 2½

NAVAL SCIENCE COURSE	O-4.0 GRADE	UNIV. GRADE	BUPERS EXAM.	PERIOD	INFANTRY ASSIGNMENT

EXTRA CURRICULAR INFORMATION

FAMILY BACKGROUND	HOBBIES AND APTITUDES	ATHLETICS	CLUBS, SOCIETIES, HONORS

SIDE 5

COLLEGE OR SCHOOL IN WHICH REGISTERED | ACADEMIC MAJOR | MINOR OR OPTION *(If applicable)*

DATE OF BIRTH (DAY, MONTH, YEAR) PLACE OF BIRTH

PARENT OR GUARDIAN

RELATIONSHIP

PARENT OR GUARDIANS ADDRESS

PHONE NO.

STUDENT'S LOCAL ADDRESS

PHONE NO.

DATE GRADUATED FROM HIGH SCHOOL *(Month, year)*

HIGH SCHOOL FROM WHICH GRADUATED

OTHER COLLEGES ATTENDED

COLLEGE	FROM—	TO—	CREDITS
TOTAL DEGREE CREDITS ALLOWED			

OTHER PERSONAL DATA

IBM DATA	CODE	DECODE
ENROLLED AS		
DUTY PREFERRED		
UPPER LEVEL DESIG.		
ORIGIN TYPE		
START TERM		
CLASS STATUS ENT.		
COMPLETION DATE		
ACADEMIC MAJOR		

PAY DATA

VOUCHER WITH WHICH CONTRACT IS FILED

NO.	DATE

SUBSISTENCE PAID

From—	*To—*

REGULAR PAY PAID

From—	*To—*

ACTIVE DUTY PAY PAID

From—	*To—*

PHYSICAL EXAMINATIONS

DATE	REMARKS

STATUS, LEAVE, AND TRANSFER RECORD

PRIOR MILITARY SERVICE

(1) ORIGINALLY ENROLLED AT

AS A ON

COMMISSIONING CHECK-OFF

TYPE OF COMMISSION DESIRED	
PRECOMMISSIONING PHYSICAL COMPLETED	
OFFICER'S CLASSIFICATION TEST COMPLETED	
QUALIFICATION QUESTIONNAIRE COMPLETED	
QUALIFICATION RECORD JACKET COMPLETED	
TRAINING SCHOOL REPORT COMPLETED	
DUTY RECOMMENDATION FORM COMPLETED	

TYPE DEGREE RECEIVED	IN MAJOR OR CURRICULUM

ADDITIONAL REQUIREMENTS

1 1/2 YEARS ALGEBRA	
GEOMETRY	
TRIGONOMETRY	
COLLEGE PHYSICS	
COLLEGE ENGLISH	
SWIMMING	

FINAL DISPOSITION

16—60611-1

PPLICATION FOR NROTC AND NACP

VPERS-912 (REV. 12-46)

lease print or type answers. All questions must be answered.
rite "none" or place an "X" in any blank not applicable to you.

DATE

AME (*Last*) (*First*) (*Middle*)

APPLICANT FOR (*Check one*)

☐ NAVAL RESERVE OFFICERS TRAINING CORPS ☐ NAVAL AVIATION COLLEGE PROGRAM

ERMANENT HOME ADDRESS (*Number and street*) (*City*) (*County*) (*State*)

LACE OF BIRTH (*City*) (*County*) (*State*)

DATE OF BIRTH (*Day*) (*Month*) (*Year*)

FOREIGN BORN (*Date naturalized*) (*Place where naturalized*) (*Certificate No.*)

DUCATION

HIGH SCHOOLS ATTENDED (Name and location)	DATES ATTENDED	YEARS COMPLETED	DATE GRADUATED

COLLEGES ATTENDED (Name and location)	DATES ATTENDED	YEARS COMPLETED	DATE GRADUATED

TRACURRICULAR ACTIVITIES PARTICIPATED IN (Indicate offices held, etc.)

THLETICS

TUDENT GOVERNMENT

LUBS, SOCIETIES, AND ORGANIZATIONS

CHOLARSHIPS, HONORS, AWARDS, ETC. (*Athletic or scholarship*)

ATTACH RECENT PHOTOGRAPHS, ONE FULL FACE AND ONE PROFILE, OF HEAD AND SHOULDERS. SIZE 2½ X 2½ INCHES, IN THE SPACE PROVIDED.

(*Over*)

LITARY EXPERIENCE

SERVICE	DATES OF DUTY	RANKS OR RATING HELD	CHARACTER OF DISCHARGE

RSONAL HISTORY (*NACP candidates indicate any aviation or related subjects studied*)

BBIES

RT- OR FULL-TIME EMPLOYMENT (*Specify type of work and dates of employment*)

ıve you ever been arrested, summoned into court as a defendant, or indicted, or convicted, or ımprisoned, or placed on probation, or has any case against you been filed, or have you ever been ɔrdered to deposit collateral for alleged breach or violation of any law or police regulation or ɔrdnance whatsoever? (*Check one*) ☐ YES ☐ NO

If so attach, to this form a sheet of paper (size 8 x 10½ inches) and list thereon all cases, without exception whatsoever, giving in each case (1) the date, (2) your age at the time, (3) the place where the alleged violation occurred, (4) the name and location of the court, (5) the nature of the offense or violation, (6) the penalty, if any, imposed, or other disposition. The above question includes arrests by military or naval authorities and disciplinary action imposed by court martial, as well as civil cases.

ve you ever claimed or been granted a pension, disability allowance, disability compensation, or etired pay from the government of the United States? (*Check one*) ☐ YES ☐ NO

If so, attach to this form a sheet of paper (size 8 x 10½ inches) and state full details thereon.

ve you ever been known by any other name or names other than that used in this application? (*Check one*) ☐ YES ☐ NO

If so, even if such differences were only differences in spelling, explain in affidavit form and submit with this application.

ve you ever failed flight training in the Army or Navy? ☐ YES ☐ NO

ertify that all statements made in this application and any additional statements pertaining thereto e entirely true and complete to the best of my knowledge and belief.

(Signature of applicant in full)

U. S. GOVERNMENT PRINTING OFFICE 16—53160-1

REFERENCE QUESTIONNAIRE—NAVAL OFFICER CANDIDATE TRAINING PROGRAM

NAVPERS–919 (Rev. 10–48)

CONFIDENTIAL
(Only after being filled in)

This is a CONFIDENTIAL report to be mailed directly to the Office of Naval Office Procurement indicated on the reverse of this form. The applicant is NOT to see this report.

NAME OF APPLICANT (*Last*)	(*First*)	(*Middle*)	DATE

INSTRUCTIONS

1. The person whose name appears above is applying for a Naval Officer Candidate Training Program. Because of the importance of this program and the need for selecting only those candidates who are potential leaders by reason of their intelligence, character, and personality, it is necessary that careful thought be given to the completion of this form. While certain of the applicant's abilities, e. g., intelligence, scholastic ability, appearance, etc., can be measured by means of tests, records, and interviews, your careful analysis of the applicant will assist the Navy in determining some of the more intangible capabilities such as leadership, initiative, and determination.

2. In filling out the blank, it must be kept in mind that the applicant's qualifications cannot be evaluated on a basis similar to that used for adults; instead, they must be weighed against those other boys of his age and in light of school performance, part-time work, or other activities in which you have had opportunity to observe his behavior. In checking off the items included under the seven personality characteristics listed below, please remember that it will only be the truly exceptional boy who ranks high in all seven categories, nor does a low rating on any one particular item constitute reason for rejection. On the reverse side of this form you will find a list of items which may be answered in narrative form. In answering these items, attempt to recall specific instances in which you have had opportunity to observe the candidate's behavior as related to these qualifications.

3. Your cooperation in supplying the Navy with this discriminating information is greatly appreciated.

OBJECTIVE RATING

DIRECTIONS: Under each general heading, check the one phrase which most accurately describes the applicant's habitual behavior with regard to that specific trait.

A. How well is he able to direct and influence others along definite lines of action?

✓	Rating Factors
	Very successful in leading others.
	Normally successful in directing and controlling others.
	Poor leader—incapable of directing others.
	No comment.

B. How well does he work with associates and others for the good of a group?

✓	Rating Factors
	Cooperates willingly and actively regardless of self-benefit; makes things go smoothly.
	Cooperates with others toward accomplishment of common cause.
	Gives limited cooperation; neglects common good for own interests.
	No comment.

C. How responsible is he? Is he able to get things done on his own?

✓	Rating Factors
	Exceptionally able to accomplish work without instructions.
	Carries out routine activity on own responsibility.
	Usually needs detailed instructions with regular checks of work.
	No comment.

D. How does he react to suggestions or criticism by others?

✓	Rating Factors
	Follows suggestions willingly.
	Listens to suggestions but may act without considering them.
	Resents suggestions and criticism.
	No comment.

E. How well does he apply attention, energy, and persistence in following a job through?

✓	Rating Factors
	Unusual perseverance; does more than expected.
	Industrious, energetic; dependable at all times.
	Completes assigned tasks of his own accord.
	Rather indifferent; does not finish job.
	Needs much prodding to complete work.
	No comment.

F. How well does he put his principles and convictions into action?

✓	Rating Factors
	Carries out his principles and convictions constantly and boldly even in face of obstacles.
	Acts according to his convictions under normal circumstances.
	Fails to carry out his convictions under adverse circumstances.
	No comment.

G. How well does he control his emotions?

✓	Rating Factors	✓	Rating Factors
	Unusual balance of responsiveness and control.		Too easily depressed, irritated, or elated.
	Usually well balanced.		No comment.
	Unresponsive; apathetic.		

16—53159–2

NARRATIVE REPORT

DIRECTIONS: Please state briefly what you know of the applicant with regard to the following items of information. If you do not know of the applicant's behavior as it applies to any one of the items, so state.

Loyalty: (*In addition to loyalty to his country, summarize his loyalty to friends, schools, organizations, etc.*)

Extracurricular activities: (*Mention types of clubs, organizations, etc., to which he belongs, if known.*)

Impressions of suitability for naval service: (*On the basis of what you know of the applicant would you be willing to entrust the lives and well-being of young men to his command when he has completed his naval training? If not, why not?*)

Other information: (*Include here any information that you deem pertinent which has not been asked above, such as discretion, honesty, neatness, companions, integrity, etc.*)

Juvenile record: (*Has the applicant ever been involved in any misconduct which may have been referred to the police or other juvenile authorities?*)

Are you related to the applicant? ☐ Yes ☐ No	If yes, state relationship.	How long have you known the applicant?

Since your answers to the foregoing items will have direct bearing upon the selection of this candidate, please immediately return this form to:

Your name:

Address:

City and State:

Employed by:

Position:

Date:

Form approved.
Budget Bureau No. 45-R182.

16—53159-2 U. S. GOVERNMENT PRINTING OFFICE

IGH SCHOOL RECORD
VPERS-923 (NEW 12-46)

NDIDATE'S NAME IN FULL

1. *This form is to be completed by the Principal or Headmaster of the school in which the applicant is now enrolled. If necessary, additional copies may be obtained for submitting the record of the candidate at previous schools.*

NGTH OF EA. CLASS PERIOD (minutes)	NO. OF PERIODS PER WEEK	NO. OF WEEKS PER YEAR	PASSING GRADE IS	CERTIFICATION GRADE IS	HONOR GRADE IS

UNUSUAL, DESCRIBE YOUR MARKING SYSTEM

CLASS RECORD

If no marks are given, check. Circle marks or checks for half-year subjects. Mark courses in progress with asterisks. Courses planned, but not yet taken, should be indicated by a dash (–).

	SUBJECT	GRADE 9 / YEAR 19	GRADE 10 / YEAR 19	GRADE 11 / YEAR 19	GRADE 12 / YEAR 19	GRADE PG / YEAR 19	NOTES (Specify laboratory periods, variation in time allowance for subjects, or any other information needed to interpret this record)
LANGUAGES	1. ENGLISH						
	2. LATIN						
	3. FRENCH						
	4. GERMAN						
	5. SPANISH						
	6. ITALIAN						
	7. GREEK						
	8.						
SOCIAL STUDIES	1. AMERICAN HISTORY						
	2. WORLD HISTORY						
	3. ANCIENT HISTORY						
	4. EUROPEAN HISTORY						
	5. ENGLISH HISTORY						
	6. CIVICS						
	7.						
	8.						
MATHEMATICS	1. ELEMENTARY ALGEBRA						
	2. INTERMEDIATE ALGEBRA						
	3. ADVANCED ALGEBRA						
	4. PLANE GEOMETRY						
	5. SOLID GEOMETRY						
	6. TRIGONOMETRY						
	7. REVIEW MATHEMATICS						
	8.						
SCIENCE	1. GENERAL SCIENCE						
	2. PHYSICS						
	3. CHEMISTRY						
	4. BIOLOGY						
	5.						
SUBJECTS	6.						
	7.						
	8.						

TE OF CANDIDATE'S GRADUATION OR PROBABLE ADUATION	IF HE HAS ALREADY GRADUATED, IS HE TAKING POSTGRADUATE WORK? ☐ YES ☐ NO	WHOLE NO. OF PUPILS IN GRADUATING CLASS	CANDIDATE'S EXACT NUMERICAL RANK IN CLASS (From the top)*

Unless the best estimate of a candidate's exact rank in class is given, this application is not complete. Rank by quarters, thirds, or fifths is not sufficient. A candidate's rank should be calculated on the basis of his work during his last two years. In schools which do not regularly rank pupils as accurate an estimate as possible should be made after consultation with the candidate's teachers.

hereby certify the above to be a true copy of the record of the above named man

(Date) *(Signature of Principal or Headmaster)*

(City) *(State)* *(Official Name of School)*

5447

INTERVIEWER'S APPRAISAL SHEET

NAVPERS-958 (REV. 10-48)

NAME (*Last*) (*First*) (*Middle*)

	−−	−	0	+	++
1. APPRAISAL OF REFERENCE QUESTIONNAIRE	☐	☐	☐	☐	☐
2. APPRAISAL OF APPLICATION BLANK	☐	☐	☐	☐	☐
3. COMPOSURE AND CONTROL	☐	☐	☐	☐	☐
4. RESPONSIVENESS	☐	☐	☐	☐	☐
5. REASONABLENESS AND OBJECTIVITY	☐	☐	☐	☐	☐
6. EFFORT TO UNDERSTAND	☐	☐	☐	☐	☐
7. WORD SELECTION AND USAGE	☐	☐	☐	☐	☐
8. VOICE QUALITY AND EMPHASIS	☐	☐	☐	☐	☐
9. GESTURES AND EXPRESSIONS	☐	☐	☐	☐	☐
0. LOOKS	☐	☐	☐	☐	☐

REMARKS

FINAL RATING

0	1 2	3 4	5 6	7 8	9 10
NOT ACCEPTABLE	BARELY ACCEPTABLE INFERIOR	A LITTLE BELOW AVERAGE	GOOD AVERAGE	SUPERIOR VERY GOOD	OUTSTANDING EXCELLENT
	10%	20%	40%	20%	10%

DATE

INTERVIEWING OFFICER

U. S. GOVERNMENT PRINTING OFFICE 16—56918-1

EXTRACT

U.S. Navy Department
Bureau of Naval Personnel

Regulations for the Administration and Training in the Naval Reserve Officers Training Corps 1947

NavPers 15034c

Sec. 505

Aptitude for the Service. (a) Each NROTC student will be observed closely by the Professor of Naval Science and the officers of his staff, for those qualities considered most desirable in a young naval officer. The following factors should be particularly noted:

1. Conduct
2. Leadership
3. Interest
4. Initiative and industry
5. Cooperation
6. Military bearing and neatness
7. Performance of duty
8. Military courtesy

(b) Aptitude marks will be given in accordance with articles 507 (c) and 602 (d) 6.

Sec. 506

Practice Cruises.--(a) To furnish NROTC students the opportunity to gain experience in the practical application of their studies in Naval Science, a practice cruise or training period is held each summer. For Regular students, these cruises and training periods are from 6 to 8 weeks in length.

(b) Each Regular NROTC student (article 301 (a)) is required to make three such cruises or training periods. Normally a practice cruise is made between the freshman and sophomore years; an "Aviation Summer" training period is held between the sophomore and junior years; a second cruise is made between the junior and senior years.

Sec. 507

Marking, Student records, and Class Standing.--(a) Marks in Naval Science subjects and in Aptitude for the Service shall be assigned on the basis of the Navy 0 to 4.0 scale.

(b) In reporting to the institution the grades earned by the students in the Naval Science courses, the Department of Naval Science shall employ the same system of marking used by other academic departments.

(c) The Department of Naval Science shall maintain individual records of the progress made by all midshipmen and NROTC contract students. For the purposes of uniformity in the keeping of naval records and in r ing, all marks will be trans- lat the institution to the Navy 0 t ition the Navy mark of 2.5

shall be considered to be the equivalent to the pass - fail standard in the institution's marking system, and the institutions passing grades will be assigned values between 2.5 and 4.0 consistent with the relative values of such grades as defined in the institution's system of marks. Similarly, failing grades will be assigned Navy scale values less than 2.5 consistent with the extent to which the institution's marking system provides marks indicating the degree of failure.

(e) At the end of each academic year, or at the end of each quarter or semester if the Professor of Naval Science so desires the class standing of each NROTC midshipman shall be calculated. For the computation of class standing the mark in aptitude for the Service given for the Summer cruise or training period shall be given equal weight with the average mark in aptitude for the academic year. The class standing will be determined by the final multiple in which the average of Aptitude for the Service marks to date will be given a weight of one, the average of marks in Naval Science courses taken to date a weight of four and the average of marks in academic courses other than Naval Science taken to date a weight of four.

S -- A + 4N + 4C where

S is the number used in determining class standing;

A is the average of Aptitude for Service Marks to date

N is the average per credit hour of Naval Science course marks to date and

C is the average per credit hour of academic course marks, other than Naval Science to date

(g) For the purpose of preparing the graduation reports required in Article 313(b) the C average will be computed on the basis of courses entered after 1 Sept 1946 only, the N average on the basis of all Naval Science Course marks, and the A average on the basis of all Aptitude for the Service marks available.

DATE DUE			

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